Amendments to the Specification

Please replace the first full paragraph on page 2 with the following amended paragraph:

Infrared sensors are devices sensitive to radiation in a limited spectral range of infrared radiation, typically from one of the NIR, SWIR, MWIR or LWIR bands. Such sensors have been used for night vision applications. However, none of the prior night vision systems provide satisfactory performance for field use under harsh environmental conditions. For example, one infrared device utilizes an LWIR sensor and a display screen to detect and display thermal energy. However, the LWIR sensor requires cryogenic cooling. This is required to maintain the sensor at a stable and high quantum efficiency. Otherwise, the display is distorted by temperature fluctuations of the sensor itself. Cooling adds substantial cost and bulk to the LWIR sensor thus limiting the applications where cryogenically equipped LWIR sensors may be used. Yet other night vision systems employ NIR sensors, such as an image intensifier (I2). Although the resolution of I2 is much better than <u>LWIR</u> ~~LIR~~, it does not function as well as the LWIR sensor in harsh environmental conditions such as in fog, haze, smoke, and complete darkness.

Please replace the second full paragraph on page 13 with the following amended paragraph:

The objective lens 124A however, has a broad spectrum that is transmissive to VIS and NIR as well as LWIR spectral ranges. The VIS and NIR spectral ranges are approximately from 0.4μ<u>m</u> to 1.1μ<u>m</u> and the LWIR spectral range is from about 7μ<u>m</u> to 18μ<u>m</u>. As such, the objective lens 124A has a sufficiently broad bandwidth to capture suitable amounts of radiation in the VIS, NIR and LWIR spectral ranges i.e. 0.4μ<u>m</u> to 18μ<u>m</u>. However, the objective lens 124A need not cover precisely the entire VIS, NIR and LWIR bandwidth. For example, suitable optical materials for the objective lens 124A may have a

bandwidth of 0.48μm to 12μm. This is acceptable in part, because the LWIR sensor may only be sensitive to 8μm – 12μm.

Please replace the final paragraph on page 14 with the following amended paragraph:

Referring generally to Figs. 2 and 3A, an optical aperture such as a beam splitter 126 that is reflective of radiation in the LWIR spectral range, and transmissive of radiation in the VIS and NIR spectral ranges is mounted behind the objective lens 124A. The beam splitter 126 reflects radiation in the LWIR spectral range from the objective lens 124A towards the LWIR sensor 118. Similarly, the beam splitter 126 transmits radiation in the VIS/NIR spectral ranges to the NIR sensor 116. Depending upon the orientation of the LWIR sensor 118 with respect to the beam splitter 126, a reflective surface such as a mirror 128 is mounted between beam splitter 126 and LWIR sensor 118 such that radiation in the LWIR spectral range entering through the aperture 120 passes through the objective lens 124A, is reflected in turn by the beam splitter 126, then by the mirror 128 towards LWIR 118. A beam splitter as used herein is any structure such as an optical aperture that is transmissive of radiation in at least a portion of one spectral range, and reflective of radiation in at least a portion of a second spectral range different from the first spectral range. For example, the beam splitter 126 may be ~~brined~~ formed for example from a dielectric material deposited on a glass substrate, or otherwise coated by a transmissive waveband filter of 0.48μ-1.1μ and a reflective waveband filter of 8μ-12μ.

Please replace the final paragraph on page 21 with the following amended paragraph:

Depending upon the selection of the LWIR sensor 118, additional electronic circuitry 144 may be required to produce an LWIR output signal 146 suitable to be processed. The electronic ~~output~~ circuitry 144 may also be utilized to implement processing feature 160 of the LWIR sensor 118 as more fully described herein. It will be observed that the BST utilizes a chopper, and as such may produce an audible sound while in operation. Therefore, in applications

where noise is a concern, the MBT may be utilized, or a suitable requirement may be applied to BST that the BST must be sufficiently quiet to be audibly undetectable, for example, at 1 meter in an open, desert ambient environment.

Please replace the final full paragraph on page 27 with the following amended paragraph:

The electronic circuitry 144 allows for power on demand to the LWIR sensor, such that when powered up, an image is immediately available. One source of delay when powering up a conventional FPA is the delay in acquiring the image caused by the TE cooling system. The FPA will not display an image until it reaches it's required Minimum Resolvable Temperature (MRT). Because it takes a finite time for the TE cooling system to reach the MRT, there can be delays as significant as one minute with conventional systems. This delay may be unacceptable under certain conditions. The present invention preferably avoids the use of such cooling strategies. Where suitable cooling is necessary, the electronic circuitry may bypass the TE cooling device at startup to achieve a faster image start up, then switch in the TE cooling when appropriate. The exact electronic circuitry 144 implemented will depend upon the specific requirements of the application. However, an example of a suitable control scheme is to convert the output of the UFPA to a digital signal using an analog to digital converter, then to a digital signal processing circuit, preferably a single digital signal processing chip such as a DSP chip or an ~~Altera~~ ALTERA chip. Within the ~~Altera~~ ALTERA chip, all signal processing can be implemented using ~~Altera's~~ ALTERA Variable Hardware Description Language (VHDL).